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Tracor Document No. T-74-RV-5200-U

ONR CONTRACT  
N00014-71-C-0438

ANNUAL REPORT  
FOR  
1 MAY 1973 - 30 APRIL 1974

Submitted to  
Long Range Acoustic  
Propagation Office  
Office of Naval Research  
Department of the Navy  
Arlington, Virginia 21770  
Attn: Code 102-OSC

May 24, 1974

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**Tracor Sciences & Systems**

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Rockville, Maryland 20850  
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**Tracor Sciences & Systems**

Tracor Document No. T-74-RV-5200-U  
Tracor Contract No. N00014-71-C-0438

ONR CONTRACT  
N00014-71-C-0438

Annual Report  
for  
1 May 1973 - 30 April 1974

May 24, 1974

Approved by:



Wendell C. Murray  
Manager  
Systems Technology Division

Submitted by:



J. T. Gottwald  
Director  
Ocean Sciences Department

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## Tracor Sciences & Systems

### 1.0 INTRODUCTION

During the period 1 May 1973 to 30 April 1974, Tracor, Inc. was tasked to perform the following work under Contract N00014-71-C-0438, by the Manager, Long Range Acoustic Propagation Project (LRAPP).

#### 1.1 IOMEDEX

1. Analysis and validation of the data contained in the IOMEDEX Data Library.
2. Identification and analysis of high interest data sets from IOMEDEX.
3. Preparation and publication of a report on the application of IOMEDEX data to surveillance system design.
4. Preparation and publication of a report which presents the IOMEDEX data suitable for model validation.
5. Prepare and publish a report summarizing the results of the IOMED Exercise, based on experience with the IOMEDEX data library and results reported previously by IOMEDEX participants.

#### 1.2 MSS Baseline Test

1. Comprehensive test planning including test objectives, site selection and test plan preparation.
2. Coordination and liaison with all participants.
3. Direction of the at-sea exercise.
4. Preparation and submission of a summary test report.

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### 1.3 Ridge Acoustic Exercise

1. Preparation of a test plan to coordinate the available resources to acquire the necessary acoustic data.
2. Coordination of exercise planning and logistics to insure that the participants are fully informed and equipped to perform the required functions.
3. Direction of the at-sea phase of the exercise.

### 1.4 MSS Area Assessment

Determine criteria for assessment of the capabilities of the MSS for the CHURCH ANCHOR area, based upon the system requirements and the environmental acoustic data available.

### 1.5 Mediterranean ASW Augmentation Program

1. Identify and synthesize existing LRAPP Mediterranean data.
2. Identify and synthesize existing non-LRAPP Mediterranean data.
3. Identify Mediterranean ASW data deficiencies.
4. Identify sonar systems of interest and relate their performance characteristics to existing performance prediction models.

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### 2.0 WORK PERFORMED DURING THE PERIOD 1 MAY 1973 - 30 APRIL 1974

During the period 1 May 1973 - 30 April 1974 the following work was accomplished in accordance with the tasks of Contract N00014-71-C-0438:

#### 2.1 IOMEDEX

1. The IOMEDEX Data has been examined, evaluated and analyzed. The validated data has been stored on a digital magnetic tape library for easy retrieval.
2. High interest data sets were identified and further reduced by NUSC/NLL and NRL at the request of the Long Range Acoustic Propagation Project. Comparison of the new data with the original data revealed discrepancies in the ANB data collected at Site A. The total data set was reanalyzed to correct the discrepancies and the new data entered into the library.
3. The validated IOMEDEX data has been provided to AESD on magnetic tape in a form suitable for model evaluation work with supporting information provided in an accompanying report entitled, "IOMEDEX Data Report".
4. A report treating the application of IOMEDEX data to surveillance system design and operation has been submitted for review.
5. The "IOMEDEX Summary Report" has been prepared and published under the direction and coordination of LRAPP.

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### 2.2 MSS Baseline Test

1. In support of the MSS development, Tracor performed test planning including development of test objectives, test site selection, and test plan preparation and publication. This effort included two site selection processes involved with moving the test from the Pacific Ocean to the Caribbean Sea.
2. Tracor provided coordination and liaison with all test participants to insure that they were fully informed and equipped to perform the required functions. In addition, Tracor provided the staging area in St. Croix for pre-test preparations.
3. Tracor provided the at-sea test director to insure compliance with the test objectives and adherence to the test plan.
4. Tracor prepared and published a summary of the at-sea phase of the MSS Baseline Test.

### 2.3 Ridge Acoustics Exercise

1. Tracor prepared an exercise plan for the Ridge Acoustics Exercise. This plan coordinated the resources available at the end of the SQUARE DEAL Exercise and NRL Cruise 73-16-02 to acquire data in support of the development of FDS.
2. A technical test director was provided to coordinate exercise planning and logistics to insure successful completion of the exercise which involved four ships.
3. Tracor provided a technical test director to coordinate the at-sea phase of the exercise. The test was completed with the successful collection of 95% of planned data.

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### 2.4 MSS Area Assessment

1. Tracor has developed a coordinated assessment criteria which integrates the MSS assessment with the assessment of other surveillance systems. This approach was submitted in a document entitled "CHURCH ANCHOR Area Systems Assessment Program".
2. MSS system parameters required for the assessment effort were identified and have been documented. These parameters were extracted from existing MSS program documents and discussed with PME-124-30.

### 2.5 Mediterranean ASW Augmentation Program

1. Data collected in the Mediterranean Sea under LRAPP auspices has been cataloged in the "LRAPP Mediterranean Data Catalog".
2. Mediterranean data from all identifiable sources has been collected, evaluated and cataloged. The catalog of this data is in preparation.
3. Acoustic ASW systems of interest in the Mediterranean Sea have been identified and their performance characteristics cataloged.



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### 3.0 STATUS

A comparison of the contract task statements and the work completed indicates that all but the following four items have been completed:

1. Publication of the IOMEDEX Application Report.  
This report was initially submitted for review on 20 August 1973. The first revision was submitted for review on 21 November 1973 and the second revision was submitted for review on 7 May 1974.
2. The Mediterranean Data Catalog is currently in preparation.
3. The Mediterranean ASW Data Deficiency Synopsis will be prepared following submission of Item 2.
4. The Sonar System Parameter Synopsis is in preparation.

UNCLASSIFIED

Security Classification

## DOCUMENT CONTROL DATA - R &amp; D

Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified

1. ORIGINATING ACTIVITY (Corporate author) Tracor, Inc. 1601 Research Blvd. Rockville, Maryland 20850		2a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED	
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13. ABSTRACT This report presents an outline of the work performed under the subject contract for the Office of Naval Research during the reporting period.			



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**MEMORANDUM FOR DISTRIBUTION LIST**

**Subj: DECLASSIFICATION OF LONG RANGE ACOUSTIC PROPAGATION PROJECT (LRAPP) DOCUMENTS**

**Ref: (a) SECNAVINST 5510.36**

**Encl: (1) List of DECLASSIFIED LRAPP Documents**

1. In accordance with reference (a), a declassification review has been conducted on a number of classified LRAPP documents.
2. The LRAPP documents listed in enclosure (1) have been downgraded to UNCLASSIFIED and have been approved for public release. These documents should be remarked as follows:

Classification changed to UNCLASSIFIED by authority of the Chief of Naval Operations (N772) letter N772A/6U875630, 20 January 2006.

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3. Questions may be directed to the undersigned on (703) 696-4619, DSN 426-4619.

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BRIAN LINK  
By direction

Subj: DECLASSIFICATION OF LONG RANGE ACOUSTIC PROPAGATION PROJECT  
(LRAPP) DOCUMENTS

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# Declassified LRAPP Documents

Report Number	Personal Author	Title	Publication Source (Originator)	Pub. Date	Current Availability	Class.
WHOI73-59	Tollios, C. D.	THE ACODAC DATA PROCESSING SYSTEM	Woods Hole Oceanographic Institution	730901	AD0773114; ND	U
Unavailable	Russell, J. J.	DOCUMENTATION FOR COMPUTER PROGRAM SUMMARY: A COMPUTER PROGRAM TO SUMMARIZE SOUND SPEED PROFILE DATA	Naval Undersea Center	731001	AD0918907	U
MC001Vol2	Unavailable	CHURCH ANCHOR DATA ANALYSIS PLAN VOL 2 (U)	Maury Center for Ocean Science	731001	ND	U
73-9M7-VERAY-R2	Jones, C. H.	LRAPP VERTICAL ARRAY- PHASE III	Westinghouse Research Laboratories	731105	ADA001130; ND	U
55	Weinstein, M. S., et al.	SUS QUALITY ASSESSMENT	Underwater Systems, Inc.	731201	AD 785-875	U
ARL-TM-73-42	Mitchell, S. K., et al.	QUALITY CONTROL ANALYSIS OF SUS PROCESSING FROM ACODAC DATA	University of Texas, Applied Research Laboratories	731220	AD 800-283	U
Unavailable	Daubin, S. C.	CHURCH GABBRO TECHNICAL NOTE: CONTINUOUS CURRENT PROFILES	University of Miami, Rosenstiel School of Marine and Atmospheric Science	740101	AD0775333	U
Unavailable	Bitterman, D. S.	ACODAC AMBIENT NOISE SYSTEM	Woods Hole Oceanographic Institution	740101	ADA009440	U
ONR MC-002 VOL. 2; XONICS 885	Unavailable	LONG RANGE ACOUSTIC PROPAGATION PROJECT (LRAPP). SQUARE DEAL DATA ANALYSIS PLAN (U) VOLUME 2 - ANNEXES	Maury Center for Ocean Science; Xonics, Inc.	740101	ND	U
ARL-TM-74-12	Groman, R. O., et al.	SPECIAL HARDWARE FOR ARL ANALYSIS OF ACODAC DATA	University of Texas, Applied Research Laboratories	740314	ADA000295; ND	U
Unavailable	Unavailable	ASEPS NEAR FIELD TRANSMISSION LOSS MODIFICATION, P-2205	Ocean Data Systems, Inc.	740401	ADA096583	U
Report 001; MSAG-1	Unavailable	MEASUREMENT SYSTEMS ADVISORY GROUP	Office of Naval Research	740401	ADA096586; ND	U
ACR-196	Gregory, J. B.	PROJECT PACIFIC SEA SPIDER, TECHNOLOGY USED IN DEVELOPING A DEEP-OCEAN ULTRASTABLE PLATFORM	Office of Naval Research	740412	AD0529945; ND	U
Unavailable	Gottwald, J. T.	ANNUAL REPORT FOR 1 MAY 1973 - 30 APRIL 1974	Tracor, Inc.	740524	AD0920210	U
Unavailable	Unavailable	ACOUSTIC MODEL SUPPORT ACTIVITIES, P-2220	Ocean Data Systems, Inc.	740530	ADA096584	U
HCI-CMC-18540	Daubin, S. C.	TRANSMISSION LOSS OF LOW FREQUENCY UNDERWATER SOUND IN THE CAYMAN TROUGH (CHURCH GABBRO TECHNICAL NOTE)	University of Miami, Rosenstiel School of Marine and Atmospheric Science	740601	ADC000424; ND	U
HCI-CMC-18343	Daubin, S. C.	AMBIENT NOISE IN THE NORTHWEST CARIBBEAN SEA (CHURCH GABBRO TECHNICAL NOTE) (U)	University of Miami, Rosenstiel School of Marine and Atmospheric Science	740601	ND	U
Unavailable	Barnes, A., et al.	DISCRETE SHIPPING MODEL	Planning Systems, Inc.	740604	ND	U